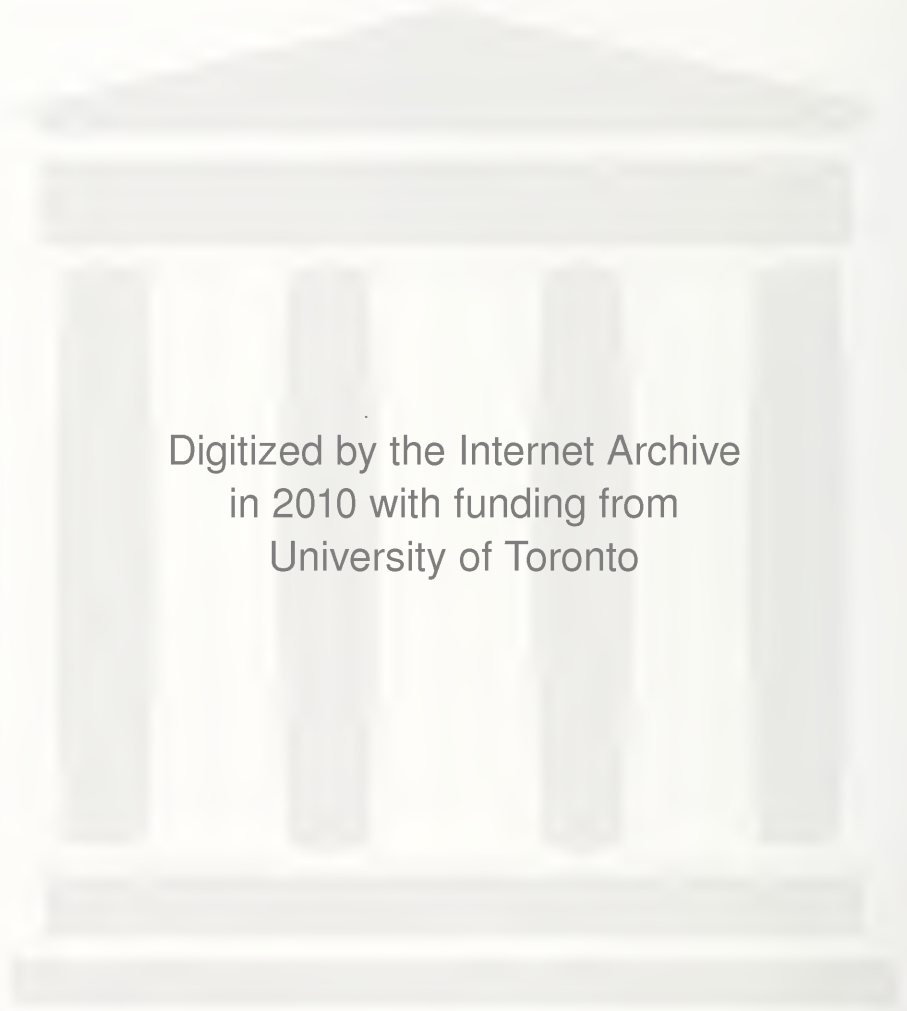

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ENGINEERING STORAGE

THE South African MINING JOURNAL

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THE SOUTH AFRICAN

Mining Journal

AND ENGINEERING RECORD.

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South African Mines, Commerce and Industries.

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CONTENTS.

Notes and News.

Mine Ambulance Competition: Underground Workers' Shield.

The sixth annual competition for the Underground Workers' Shield, the floating trophy presented by the Chemical, Metallurgical and Mining Society of South Africa, will be held, by kind permission of the Directors and Manager, at the City Deep, Ltd., on Sunday next, the 25th inst. A Red Cross flag will denote the spot. The mine is situated beyond Prospect Township, and may be reached by the service of 'buses, leaving the corner of Rissik and Fox Streets at intervals. The entries received are as under, but the sections, and the order in which the teams will compete, will be notified later: City Deep, Ltd., Crown Mines (No. 3 Shaft), Crown Mines (No. 4 Shaft), Crown Mines (No. 5 Shaft), Crown Mines (No. 7 Shaft), De Beers Cons. Mines, E.R.P.M. (Angelo), E.R.P.M. (Comet), E.R.P.M. (Driefontein), E.R.P.M. (Hercules), Geldenhuis Deep, Jupiter, Knight Central, Luipaardsvlei Estate, Nourse Mines, Robinson "A," Robinson "B," Village Deep, Village Main Reef, Wolhuter. The Competition will commence at 8.45 a.m., and all teams are requested to meet at the West Shaft head not later than 8.15 a.m., in order to be in readiness. Suitable underground clothes must be brought and worn by all competitors. By the kindness of the management, lunch will be provided for the competitors and officials. A limited number of spectators, preferably those interested in first-aid, will be permitted underground, but in view of the number of teams competing, and the limited transport accommodation, ladies will not be permitted underground on this occasion.

* * * *

Village Main Reef Fall of Rock.

We are officially advised that the following cable was sent to the Head Office, London, on 22nd August, 1918:—"Severe earth tremor collapsed the 15th level ore pass, cutting off supply of higher grade ore from lower levels for two weeks. Screens consequently averaging 2 dwts. lower than last month. Current month's results will be heavily affected."

* * * *

The S.A. Mining Year Book.

The 1918-19 edition of the S.A. Mining Year Book is now on sale, putting on permanent record the returns of the mining companies of South Africa down to within a month of publication. The work, despite increased cost of production and delays in the mails, is fuller and more comprehensive than ever, and, in addition to being the only reference volume of its kind produced in this country, is able to anticipate by nearly a year, the data contained in works of reference printed in London. The S.A. Mining Year Book has come to be recognised as the standard work of reference on the mines of this country, and its circulation has been steadily growing each year, both in South Africa and overseas. It gives all the particulars of all the gold, diamond, coal and base metal mining companies; and is at once a monument to the size of the industry and a striking tribute to the very complete publicity given to the results of its operations. The work has been excellently printed and produced by the Argus Co., and may be obtained from the office of this paper, from the Central News Agency, Ltd., or from the *Financial News* offices, 111 Queen Victoria Street, London, E.C.

* * * *

S.W. Africa Company.

The report of the South West Africa Company for 1917 states that there was a profit of £96; £88,745 was brought in. Usual course followed regarding German business. No provision made for depreciation on investments. Investments stand at £1,288,875, of which British securities and those of foreign countries in the company's control stood at £555,115, against market value of £484,000. No sales of land in 1916 and 1917. Operations in South-West Africa restricted to maintaining establishment. Prospecting work remained suspended. Otavi Exploring Syndicate continued work on limited scale, operations being

chiefly confined to winning and exporting of copper ore from Bobos and Groot Otavi and investigation of mottramite deposit at Nosib. Since July, 1915, when South-West Africa was effectively occupied by the Union Forces, the syndicate has shipped 693 tons high-grade copper ore, as well as a small quantity of mottramite which was disposed of to various firms for experimental purposes.

* * * *

Natal Colliery Dividends.

The following is a list of dividends declared by the Natal collieries for the year 1917, taken from returns furnished to the Government Mining Engineer:—

	Capital.	Per cent.	Dividend.
Dundee Coal Co.	£153,500	15	£23,025
Glencoe (Natal) Collieries	250,000	5	12,500
Hatting Spruit Collieries...	70,000	10	7,000
Natal Navigation Collieries	419,000	7½	31,425
South African Collieries ...	101,806	15	15,271
Elandslaagte Collieries ...	157,220	2½	3,930
Durban Navigation Colls.	158,171	10	15,817
Natal Cambrian Collieries	89,550	5	4,478
Newcastle Colliery	49,709	3¾	4,35.
	49,821	5	
Vryheid Coke Co.	16,007	21¼	3,401
Natal Steam Coal Co. ...	50,000	20	10,000

* * * *

Zinc and Explosives.

According to the Australian papers, the zinc rolling mill now working in Perth has kept the mining companies supplied with zinc shavings; no hitch has occurred in the operation of the mill, whilst the cost of rolling has steadily declined; the present cost of shavings is £75, as compared with £93 per ton at the date of the last annual report. The rolling mill, erected by Messrs. G. Wills & Co., Ltd., in Perth, is now supplying the South African, New Zealand, and Tasmanian markets, and its value to the industry is very great, as it is now impossible to obtain zinc sheets from either Europe or America. The supply of explosives has been well kept up during the year, although the grade imported is not altogether suitable to the Western Australian mines. The lower grade causes an increased consumption in development work and has the effect of increasing, instead of decreasing, the consumption of nitro-glycerine. This fact was pointed out to the Imperial Authorities, with the result that permission was given for an extra supply of higher grade explosive to be shipped to Western Australia, but on the arrival of the consignment, many months ago, the Commonwealth authorities forbade its issue to the mining companies, and although representations have been made again and again it is still being allowed to deteriorate in the magazines instead of being put to useful work.

* * * *

Gold Export Regulations.

A new proclamation regarding the export of gold appears in the current *Gazette*. It lays down that: Every person who intends proceeding from any port in the Union of South Africa to any port or ports on the East Coast of Africa outside the limits of the Union, or to any country overseas that is situate east of the East Coast of Africa, shall present himself, with his baggage and effects, at the Customs Baggage Warehouse at the port of embarkation in the Union at least two hours before the ship's departure, in order that the collector or other principal officer of customs may satisfy himself that such person has not on his person or in his baggage or effects: (a) any gold in coin beyond the sum of £5 as personal cash; (b) any gold bullion whatsoever; and (c) any gold ornaments. Every such person shall thereafter proceed direct on board ship, and if he subsequently lands he must again satisfy the collector or other principal officer of customs as to the non-possession of gold as aforesaid. Any person who exports gold by sea: (a) in coin, (b) in the form of bullion, or (c) in the form of jewellery or ornaments to any port or ports on the East Coast of Africa outside the limits of the Union, or to any country overseas that is situate east of the East Coast of Africa, shall either by himself or his agent enter it by bill of entry—export (Customs Form No. 41) in duplicate.

Red Cross, South Africa.

In the course of an eloquent appeal for support, the Secretary of Red Cross, S.A., writes:—You are requested to give "until it hurts" to the Governor-General's Fund, the most important South African War Fund. When you have done that—and not before—you are asked kindly to make a note of the fact that the one great annual appeal of the Red Cross to the Empire for the sick and wounded will be made in October next. Hundreds of thousands of our sick and wounded soldiers and sailors have suffered untold agonies for you in the great battles for freedom; they have lost limbs, sight, hearing. They counted not the cost; they did their duty—gave of their best. What would you not pay to recover your sight, the use of limbs, the sense of hearing, to avoid the constant pain of old wounds?— The Red Cross does its utmost to alleviate the sufferings of those lying sorely hurt on the battlefield, in thousands of the hospitals and other places, wherever they may be. Its expenditure is at the rate of over £8 every minute of the day. The cost of administration is less than 4d. in the pound, which is covered by the interest on the investment of temporary surplus funds. Therefore every penny that you give will go to the needs of the sick and wounded. You are requested to remember this in October next, and to make a very special effort to give generously, even lavishly, in response to the annual appeal of the Red Cross. Even if you give "until it hurts," you will not suffer as our soldiers have suffered for you. Remember this on Our Day, 19th October, 1918.

* * * *

Rand Technical Progress.

The annual report by Mr. Hugh F. Marriott (President of the Institution of Mining and Metallurgy) as consulting engineer to the Central Mining and Investment Corporation has the following references to technical conditions and results on the Rand:—Ventilation: The total fan capacity now installed on the mines of the [Central Mining/Rand Mines] group is 3,175,000 cubic feet per minute. Health: The death-rate from disease of all natives employed by members of the native labour organisations for the year was 10·7 per thousand, as against 13·9 per thousand for the previous year. The accident rate for the year was 2·9 per thousand, as against 3·27 for the previous year. Sandfilling: The total amount of sand returned below in the mines of the group since the commencement of the process is 8,432,837 tons. The amount sent down last year was 2,026,715 tons. Cementation: The François cementation process has been introduced on the Rand during the year. The first application was at the East Rand Proprietary Mines, Ltd., where large quantities of water at high pressure have been successfully sealed off from the workings. The process is now being extended to other mines and works, notably on the Far Eastern Rand, where the elimination of the water difficulties in the upper strata will permit of speedier shaft sinking and save the heavy expense which would otherwise have to be incurred in permanent pumping plant. Metallurgical practice: The average gold-content of the sand and slime residues of the ore treated for the year is 1·25s. per ton milled, being ·05s. less than for the previous year. The total gold recovered gave an average of 80·4s. per ton milled, which, on a basis of mill yield plus pulp, shows an extraction of 97·0 per cent., as against 96·7 per cent. for 1916. A low record in cyanide consumption, of ·169 lb. per ton treated, was obtained in the City Deep plant for the month of August. General: All essential imported supplies for the mines of the Transvaal are now pooled and under the control of the Chamber of Mines. By this means individual mines are safeguarded against dislocation of operations, and excessive increase of stocks is avoided, with consequent relief to shipping. The restricted supplies of glycerine have necessitated an increased use of lower grade explosives in mining operations. These have been found effective, and stoping is now carried on with lower grade explosives of qualities varying between 60 per cent. and 40 per cent. The use of blasting gelatine is now entirely confined to development work.

Vryheid (Natal) Railway and Coal.

For the twelve months ended January 31 last the net profits of the Vryheid (Natal) Railway and Coal Company showed little alteration from those of the preceding period, being £33,452 against £33,081. At January 31, 1916, the profit was £13,553. With the amount brought in the sum available is £66,953. The directors wisely place £20,000 to a reserve fund, pay a dividend of 5 per cent., and carry forward £28,563. The financial position is good, the excess of cash and cash assets over liabilities being about £34,000, before allowing for the dividend, which requires £18,370. There are £100,000 of debentures carrying 6 per cent. redeemable May 1, 1924, at 110 per cent., the company having the right to redeem on or before May 1 next at 105 per cent. In the event of any of the stock being unredeemed next May a cash bonus of 5 per cent. is payable. Owing to various causes the output of coal fell 20,000 tons, to 401,000 tons, but the higher selling price enabled the company to benefit. Apparently the company has good prospects from the standpoint of by-products, for investigations carried out indicate that, with an efficient plant for the production of coke, sulphate of ammonia, tar, and benzol, a profitable industry can be established at Hlobane.

* * * *

Should Gold Mining be Suspended?

In the mining journals and other periodicals of America the question is being discussed as to whether during the war gold-mining should not be curtailed or entirely suspended. Answering the query—"Is gold-mining necessary during the war?" a correspondent in the *Engineering and Mining Journal*, of New York (Mr. E. B. Coolidge, of Maiden, Montana), says:—Not absolutely necessary at this stage of the war, when we practically control the gold reserve of the world; but I believe it would be the height of folly to curtail the output of gold in any manner, as it will have very little bearing on the outcome of the war. We all know that, calculated on the buying power of an ounce of metal, gold has really depreciated from 35 per cent. to 50 per cent. of its value during the last three years. Gold-mining should be encouraged in every possible way where the operators are producing with a close margin of profit, due to gold depreciation, and even a taxation exemption should be considered. Gold, being the monetary standard of the world, will be absolutely necessary in the adjustment of conditions after the war is over. But the present gold reserve of the world does not represent 10 per cent. of the current values of exchange; a condition due to the exorbitant prices, high wages, and inflated values placed on all properties and business operations. Bankers maintain that the gold reserve should be at least 25 per cent. for conservative banking. I take this opportunity to ask a question for future discussion. The gold reserve being less than 10 per cent., what will be the condition and how will the exchange problem be solved after the war when the countries of the world get back to normal conditions? Gold, or other metals used as standards, must retain their proportion to the money values of the world, and this is impossible with gold worth 20·67 dollars per oz., unless some other standard is adopted. The labouring class will never consent to a reduction in wages; the conditions of 1913 will never be seen again. So how will the problem be solved? My answer is as follows: Since the United States Government, as well as other countries, has called in practically all gold coins, I suggest that the world refrain from any gold coinage and hold the gold reserves at the local seats of government. Gold can thus be placed at a premium, or, rather, a new standard, which will place the money situation on a sound basis. The manufacture of non-essentials, such as automobiles and other pleasure appliances, should be curtailed first; also unnecessary improvements on roads, buildings, and parks could be abandoned until after the war. Many things should go before the suspension of gold-mining is even thought of, because it is the one basis of stable government. We cannot do without it unless we have something to replace it, for under normal peace conditions the world's business can be conducted on the theory of "I owe you and you owe me" only to a limited extent.

TOPICS OF THE WEEK.

THE INDUSTRIAL FEDERATION AND THE OFFER OF THE CHAMBER OF MINES.

The fact that the Federation of Trade Unions has recommended its constituent bodies to accept the latest offer of the Chamber of Mines did not surprise anyone who had followed the recent correspondence between the Chamber and the Federation. The delegates to the latter body spent most of last Sunday debating the position, and by a majority of three to one appear to have recognised that the industry was up against a set of circumstances that did not admit of any increase in the Chamber's liberal offer. In a recent issue, the case made out by the Chamber was printed in full, and it may be well to place also on record the final views of the Federation as expressed by an official spokesman, the General Secretary, Mr. Crawford, on Sunday. Mr. Crawford in the course of his speech referred to the improved war bonus offered by the Chamber, and defended the demand of £8 2s. as wages to mechanics. He pointed out that a strike would mean dislocation of all unions which had been built up, and the strength of the organisations would collapse. If the strike succeeded there would be from 16 to 19 mines that could not meet the demand in the matter of wages. He admitted that a strike would affect 8,000 men, or about 40,000 men, women and children, and incidentally the prosperity of South Africa was almost entirely dependent on the mines. The workers, he continued, were not satisfied to bear the burden of the war whilst another section was evading its obligations and battening on their efforts. The Federation was pushing wages up all along the line, and when these reached a certain point it would begin all over again, and push wages a bit more. Although the Chamber's offer had been accepted, details had still to be discussed. Finally, he urged support for the co-operative stores' movement to combat profiteering and bring down the cost of living. He said wholesalers were already feeling the effect of the movement. They were, he added, going in for production and manufacture, and were going to get at the root of the commercial system. In the course of a later interview with a Press representative, Mr. Crawford said that if the unions struck to enforce a higher scale of war bonus, and failed in the strike, they would lose the good position they had built up for themselves since the commencement of the war. The failure of a strike on a big scale would mean the breaking up of the trade unions, inasmuch as a strike could only fail by large numbers of workers seceding from the unions and conforming to the lower standard offered by the mines. On the other hand, if a strike were successful the position would be—if the figures of the Chamber of Mines were to be accepted, and the unions were not in a position to challenge them—that quite a number of mines—from 15 to 18—would be unable to conform to the higher standard and continue operations at a profit. The result would be that they would close down, throwing out of employment over 8,000 white men, and 40,000 men and women and children and other workers and families who were dependent on the prosperity of the mines, not only in subsidiary industries in the Transvaal, but throughout the length and breadth of South Africa. A set of conditions would be so created that the higher standard of wages that would be paid on more prosperous mines would be untenable. The result again would tend to the breaking up of trade union organization, since a large army of unemployed workers would be compelled to abandon trade union standards in their struggle for existence. These are all, of course, self-evident propositions, and do not admit of any denial. It only remains for the several unions to give proof of their own good sense by confirming the decision of the Federation. The Chamber of Mines, at any rate, can be relied upon to carry out its part of the bargain by helping in every way to combat the increase in the cost of living.

THE DECLINE IN GOLD PRODUCTION.

How War Conditions Are Affecting the American and Australian Output.

The mail brings news of the continued decline in the output of gold in America and Australia.

Australian Gold Production.

The figures for the first four months of the gold production of Australia show that the output for the term was 411,462 ozs., as against 493,909 for the corresponding four months in 1917, and 543,674 ozs. in 1916. All the States show a reduction in output, the most marked being Victoria, Western Australia, and Queensland. It is to be feared (says the *Australasian*, which publishes these figures) that the next four months' return will show a further decline, as mines that have been large producers in the past are either being worked on a very much smaller scale by companies, are being thrown into the hands of tributors, or are being closed down entirely. The figures for the past four months compare with the two preceding years of the corresponding periods as under:—

	1916. Ozs. Fine.	1917. Ozs. Fine.	1918. Ozs. Fine.
Victoria	77,713	68,966	42,966
Western Australia ...	346,475	335,163	290,977
New South Wales ...	39,708	27,413	26,027
Queensland	72,096	55,667	44,492
*South Australia ...	1,500	1,500	1,500
*Tasmania	6,182	5,190	4,500
Total	543,674	493,909	411,462

* Approximate.

Westralian Mining in War Time.

A recent issue of the *Melbourne Argus* has the following: "I notice that attention is directed by articles in *The Argus* to the fact that the vital importance of increasing the output of gold is being realised in various parts of the British Empire," said the Treasurer of the Western Australia (Mr. James Gardiner), who arrived in Melbourne yesterday to attend the Treasurers' Conference, when seen at Menzies' Hotel. "I hope that it is not being realised too late. In Western Australia we had before the war the most skilled gold miners in the world. Of these men 5,000 have enlisted from Kalgoorlie alone. As a result labour is scarce, and often inferior in quality. The price of gold has not increased, while materials have become dearer. Then a wise, or otherwise, judge of the Arbitration Court cut down the hours—in war time—to 44 a week. At present the State is helping some of the smaller companies to keep going, or they would cease work altogether." "It was conceived in stupidity, and is ending in tragedy," continued Mr. Gardiner, referring to the effect of the war-time profits tax on Western Australia. "Apart from gold, we are trying in Western Australia to stimulate the production of such metals as lead, copper, and tin. Australia, the Empire, and the Allies want these metals, want all they can get, and but for the disastrous tax war prices would stimulate production. But the law allows a maximum profit of 10 per cent. on the capital invested, so that you have to get the maximum for 10 years if you are ever to get your capital back. What sane man would guarantee a ten years' life for any mining venture? The result is that the lead smelters established at Fremantle are likely to close, that the copper mine at Whim Creek is abandoned, and that tin-mining is languishing. In Western Australia, which has but little capital, and would have to work under difficulties in any case, this impost is killing us. It sins against all the principles of scientific taxation, and kills or cripples development. The Government of Western Australia is trying hard to increase production, and to stimulate industry, and in a number of cases we are lending to companies pound for pound on their paid-up capital, but the Federal policy will not let us do anything." Mr. Gardiner added that the war had hit Western Australia very hard by causing the withdrawal of labour from her primary industries, timber-cutting, agriculture, and the pastoral industry, as well as mining. In many districts there was scarcely an eligible man left. The State had now the highest taxation in the Commonwealth, and there were scarcely any exemptions.

The Gold Industry in America.

According to a New York contemporary, Colorado gold producers view with alarm the existing conditions affecting production, which are likely to become more and more adverse so long as the war lasts. Unfortunately, little help can be directly extended to the gold miner. Since it is conceded that no advance in the price of gold is possible, it is difficult to formulate measures that would bring relief. The elimination of all excess-profit taxes on gold mining would obviously increase output, and as larger dividends would mean greater revenues from individuals, the loss to the Government from this act would apparently be largely offset. It is probable that a strong effort to exclude gold mining from the provisions of the Federal revenue laws in order to encourage production will be made when these laws are revised. Much thought and consideration are being given to this question by financiers as well as gold producers. National and State organizations of mining men are inviting suggestions from their members for concrete plans of relief, with the hope that through united action a definite plan may be adopted which will in a measure improve the distressing conditions now confronting the mining industry. In this connection it is of interest to note that the world's gold production is rapidly declining under war conditions, and, with increased cost of production and no corresponding increase in the price of the product, the shortage may soon reach alarming proportions. Colorado's production in 1917 was $16,020,000, as against $19,154,000 in 1916. Under present conditions it is probable that gold costs more now in prospecting, discovery, development, production, and replacement of equipment than it is worth to the Colorado producer. In certain favourable instances this may not be true. It is obvious that unless relief appears soon, a more rapid decline in production must follow. The total gold production of the world decreased about $30,000,000 last year, and it is estimated that the falling off will exceed that amount this year. Considering the fact that the total output in 1917 was about $414,000,000 and that, so long as the war lasts, conditions affecting production are likely to become more adverse, there appears to be good reason for alarm.

POSSIBILITIES OF BASE METAL PRODUCTION IN SOUTH AFRICA.

[By G. H. Stanley, A.R.S.M., F.I.C.]*

It is a matter of common knowledge that the present world-war, by throwing South Africa on her own resources in many instances, and by increasing the difficulties of importing in others, and in still others by causing the prices to rise to unprecedented figures, has given a wholly unlooked-for impetus to the devlopment of South African industries. In this connection, our raw materials are receiving more attention than at any previous period, and among them ores of the base metals are becoming increasingly important. I have dealt elsewhere† with the position as regards iron and steel, and ferrous metals generally, and propose therefore to confine these notes to a consideration of the possibility of smelting and manufacturing the other common base metals of which the ores occur in workable quantity. With respect to the values of imports in the several cases, obviously the figures relating to the war period are of relatively little value, and generally the 1913 figures (though sometimes 1914) will be taken as a basis.

Tin.

In the case of tin, metal to the value of nearly £66,000 was imported in 1913. Of this the amount of actual metallic tin is not stated, but in 1914 the value of this was £10,294, and the difference was probably largely in the form of tin plate, which in 1914 amounted to nearly £50,000. On the other hand, in 1913, 3,671 tons of tin concentrate, value nearly £436,550, was exported, and in 1915, 3,835 tons, value £386,000. It is only surprising, in view of these figures, that the smelting of tin has been so long delayed. Now, however, the Zaaiplaats Company is smelting all its output in coal-fired reverberatories, and producing a very satisfactory produce, while other companies are understood to be following suit. The technical position is therefore beyond question, but it may be mentioned that electric smelting is being tried in Swaziland. The present local demand for metallic tin is therefore already satisfied, but there is, of course, a world market for the surplus, which would be exported, and as smelting costs here should not exceed those current elsewhere, the profits should be increased. With regard to South African uses for the metal, the largest consumption at present is for the manufacture of " white " or bearing metal; but solders, of which £10,000 worth per annum was imported, and bronze castings for pumps, hose connections, etc., also account for considerable consumption, and in future there should be no necessity for importation under these heads. However, the large item, tin plate, still remains open, and totals about 4,000 tons. Only about 2 per cent. of this would be metallic tin, say 80 tons—quite a small quantity, but amounting to nearly one-third of the total value. In view of the rapid development of agriculture and the almost certain establishment and rapid growth of canning factories for meat, fruit, and so on, it is only reasonable to expect a very great increase in the consumption of tin-plate, which might therefore be not unreasonably placed at £250,000 per year in the course of a few years after the war. An industry with a product of this value is well worthy of investigation, and will be seen, I think, to be well within the bounds of possibility. The steel plate required hinges on the establishment of an iron and steel industry, which may be assumed, but, from the standpoint of a modern plate and sheet mill, the quantity required, say 20,000 tons, is not very large, though sufficient, perhaps, to keep one plant for the purpose occupied. If, however, the manufacture of galvanised iron were also to be undertaken, there is little question that the amounts required would justify the erection of the requisite rolling plant as part of a large central steel works. The labour required in tinning is not of a highly skilled order, and the other materials required, chiefly sulphuric acid for pickling the sheets, and palm oil, are easily obtainable at reasonable prices; while in the tinning itself no very elaborate plant is needed.

Zinc.

In connection with zinc, it may be noted at once that there is no production in the Union at present. There is only one deposit of considerable size, the Blane-Witkop, so far as I am aware, in the Union; but a considerable amount should be recoverable from waste zinc sulphate solution on the mines, which, on the Rand, used 4,500 tons of zinc in 1913. Apart from this, the chief zinc consuming requirement of the country is, of course, galvanised iron, which in 1914 amounted to £325,000 in value, and nearly 30,000 tons in weight. This amount would probably carry about 1,200 tons of zinc. Brass castings would consume a small amount, which is difficult to gauge, as so much scrap is used. Brass importations totalled £30,000 in 1914, but much of that would have been in the form of miscellaneous fittings, commercially, if not technically, impossible of manufacture here. The ordinary distillation method of reduction involves a very heavy coal consumption—100 per cent. to 150 per cent. on the zinc produced—and high expense for refractories and labour. At several places in America electrolytic methods are in successful competition, and taken in conjunction with the possibility of treating the previously-mentioned waste sulphate solution from mines, and the relatively low cost of electricity on the Rand, would appear to offer prospects of success here. Even a recovery of 25 per cent. of the zinc used in gold precipitation would supply the whole of the zinc needed for galvanised iron production; while considerable expansion in this demand, as well as in brass manufacture, could be met by the use of the Witkop ore. This would still leave us under the necessity of importing the zinc requirements of the mines, but this is all in the form of rolled sheets, and more difficult to produce than is galvanised iron. It may be that other deposits of ore will be discovered, or, for example, the ore from Broken Hill, Rhodesia, come into use, but it seems probable that the main supplies of zinc will have to continue to be imported.

Copper.‡

In the Messina Mine we have a producer of over 2,000 tons of copper, in the form of concentrate and matte; the Union total being nearly 9,000 tons, mainly from Namaqualand, which is shipped oversea. Considering figures for consumption, we find the following imported:—Brass and copper, raw or partly manufactured, 12,000; brass and copper ware, 40,000; electrical cable and fittings, 500,000. There will be, in addition, an unknown quantity included in machinery. Apart from electrical cable and fittings, themselves very specialised and complicated manufactures, which it is unlikely could be economically produced in this country, the bulk of the importation is of very varied forms, and requirements will probably continue to be imported. The relatively small amount required for alloys, etc., could be produced here, and in the case of the Messina Company very simply, since the ore carries no gold or silver, and would not require electrolytic refining. The method I would suggest would be the so-called " direct " process, as the amount involved would scarcely justify a Bessemer plant. The financial side would require careful consideration, since already copper from Katanga is on the local market, and there they have a " straight " carbonate ore which is smelted direct to copper in water-jacketted blast furnacea.

* Paper read before the S.A. Association of Analytical Chemists.
† *S. African Journal of Science*, October, 1917; *S. African Journal of Industries*, December, 1917.

‡ Since these notes were presented, the Messina Mine has curtailed operations on account of shipping difficulties.

Lead.§

The position as regards lead is less promising. Only small occurrences are found in the Union, but on the other hand the requirement is about £40,000 worth per annum, raw and manufactured goods being in about equal proportions. Broken Hill is already in the market in a small way, but of course is hampered by freight charges, which are very appreciable in the case of a cheap metal like lead. If by systematic prospecting sufficient deposits were to be opened up in the dolomite areas, and a central smelting plant established to treat the concentrates from all the small mines, it is probable that a profitable business would result, the product being in the form of pig, for alloy manufacture, and also for manufacture of pipe and sheet.

Antimony

Ores occur in fair quantity in the Murchison Range and Steynsdorp district, and the present high prices have resulted in some activity. A few mines are hand-picking the ore, and sometimes liquating it, and at Rietfontein a few tons per month are being produced by the method of smelting in crucibles. The only use for the metal, as such, is in the preparation of alloys, such as bearing metals, type metals, etc., which are now being made in sufficient quantity to obviate any necessity for importation, though the demand is not very large. Moreover, once established, with the benefit of war prices, it is probable that the trade will be able to persist in spite of the, presumably, lower prices after the war. Export is doubtful on account of Chinese and Japanese competition. There is, however, a much larger field in the production of oxide for use as a pigment instead of white lead, the use of which is prohibited in France, and, I think, in Australia—at least such action has been contemplated there—and this is best done by the shaft furnace volatilisation process. This process is able to deal with poor ores and with only a low fuel consumption, and appears to offer the most promising means of utilising these ores, there being a large and remunerative market for the product. Experimental trials have already been made, and it is understood that arrangements are being made for the conduct of operations on a fair scale.

Aluminium.

Aluminium may be mentioned next, though the possibility of South African production seems somewhat remote. So far as I know, we have no bauxite deposits, but some of the laterite which is so abundant is quite high in alumina, and since the technical difficulties of extraction are not insuperable, constitutes a potential source of aluminium. The great difficulty is the cost of electrical power, which is usually in other countries produced by utilisation of water power, and supplied at prices in the neighbourhood of £2 per H.P. year, while on the Rand the cost is approximately seven times that. However, schemes are afoot for utilising waste coal for by-product production, and should these be co-ordinated, a much cheaper power supply should become available, and may render this and other electro-metallurgical and chemical industries possible. In any case we have the Victoria Falls within reach, and, as well, the Orange River Falls awaiting exploitation, while costs oversea, both for power and material, are rising. Moreover, with iron becoming scarcer, aluminium will become more and more important, so that there appears to be every probability, at some future date, that aluminium will be produced here.

§ Lead, sheet and pipe, is now being produced at Capetown.

Nickel.

Long before aluminium is produced, however, nickel will probably figure on the list of exports. Occurrences of nickeliferous pyrrhotite, resembling those at Sudbury in Canada, are found at Mount Ayliffe, in Griqualand East, and at Pilandsberg, in the Transvaal. In either case the ore could be smelted to copper-nickel matte in the usual way in water-jacketted blast furnaces. There being no demand for metallic nickel here, and the copper market being assumed to be satisfied, the matte would probably be shipped oversea for treatment, as is the case at present from Canada and New Caledonia, but its sulphur content, as also in the case of copper matte, might first be utilised in this country in sulphuric acid manufacture.

That, I think, covers all the common base metals, but a word may be said here about the coke supply, on which smelting so much depends. Not long since, imported coke cost £9 per ton; then Natal coke appeared on the market, and as its use increased the price declined to as little as £4, and even before the war practically none was imported. In view of the conditions in Natal, coke should be made as cheaply as in England if the demand is sufficient, and the smelting of iron ore will create a large demand. The consequent cheapening of the coke supply will react very favourably on base metal smelting, and that again, on the development and working of refractory gold ores, which can generally be treated by concentration, and smelting the concentrates with copper or lead ores, if all other methods fail, and giving another good reason for the establishment of a custom smelter, as previously referred to.

To Summarise.

The possibilities are, in the case of—

Tin.—Smelting all the concentrates locally, using part for the manufacture of alloys and tin-plate, exporting the remainder.

Zinc.—Local supplies are insufficient to meet the demand, so that importation must continue; nevertheless there is the possibility of treating ore and recovering zinc from waste solutions on mines, and manufacturing therewith galvanised iron and alloys.

Copper.—Local demand for simple manufactures is small, and can be met by smelting a portion of the pure ore. The balance might be shipped oversea as matte, but could be used to furnish sulphur for sulphuric acid plant.

Lead.—Ore deposits are small and scattered, but the ore may be concentrated and concentrate smelted at a central custom smelter, to which also auriferous concentrate could be sent for treatment. All the product could be converted to pig, pipe, and sheet for local use.

Antimony.—The small production already made is used for alloys. A large production of oxide for local use and export could also be made.

Aluminium.—Production is remotely possible by utilisation of water-power, and as costs increase elsewhere.

Nickel.—Smelting of Mount Ayliffe and Pilandsberg ores is quite possible, the matte to be shipped.

RAILWAY ELECTRIFICATION IN AMERICA AND EUROPE.

Lessons for South Africa—The Electrification of the Chicago, Milwaukee and St. Paul Railway.

To the discussion on Mr. Kirkland'a paper on railway electrification, Mr. A. E. du Pasquier contributed the following at the last meeting of the South African Institute of Electrical Engineers:—I am pleaaed to have an opportunity to contribute some remarka towards the discussion on this most interesting paper. The subject is specialy interesting at the present time, in view of the projected S.A.R. electrification, and I express my warm appreciation of the missionary and educational work Mr. Kirkland has been engaged on since July, 1917. I would like to record not only my appreciation of the paper itself, which is full of interesting data and suggestion, but also my admiration for what must constitute one of the General Electric Co.'s greatest achievements in the railway electrification line. With this understood, I shall now proceed to offer such criticisms as occur to me, and ahall venture to put before the members of thia Institute other data concerning railway electrification, which, while perhaps not strictly arising out of the subject matter of the paper under discussion, does arise in connection with some of the inferences the author has ventured to draw. Dealing with the opening remarks, some little amplification would seem necessary. The electrification of this section of the Chicago, Milwaukee and St. Paul Railroad is referred to as the largest and most important existing application of electricity to main line railway operation, as employing the highest D.C. voltage so far successfully applied, and for the first time successfully on a large scale, regenerative breaking. The point ariaes—what makes it the most important application? Is it mere length, tonnage, or grade difficulties? If it be merely a question of miles of track, or number of train miles per year, then one would suggest that the New York, New Haven and Hartford trunk line electrification, with 550 miles of track, with a daily passenger traffic of some 240 trains a day, in addition to heavy freight trains, needs inclusion; or the Italian State Lines, with 735 kilometres of track electrified, and some 200 locomotives. If its importance rests upon goods traffic or grade, then one is reminded of the fact that the Norfolk and Western electrification is handling a coal service of 65,000 tons a day on 2 per cent. gradea and over, and the Italian State Railways are operating on 3·7 per cent. grades, also with extremely heavy traffic. I am not raising thia question in any carping attitude, but the point I want to bring out is that just as heavy trains, on just as heavy grade, were already in operation. It is obviously not determined by the size of the locomotivea employed, because although these Chicago, Milwaukee and St. Paul locomotives are referred to as the most powerful ever built, it is a fact that the Norfolk and Western locomotives are as large or larger, and the latest Chicago, Milwaukee and St. Paul Westinghouse passenger locomotives larger still. I think, therefore, the author must have referred to it as the largest and most important existing application, etc.; because it has probably the longest individual section of main line track which had been electrically operated at that date, and to that extent, and that extent only, I agree with him. The second point was, it employa the highest D.C. voltage so far successfully applied. Here again, if one reads into the sentence on such a large scale, or words to that effect, the statement is quite correct, but not otherwise, because D.C. equipments operating satisfactorily at 5,000 volts have been developed by the Westinghouse Co. and put into service on the Michigan United Traction Co.'s lines. The last point was, it employs for the first time successfully, and on a large scale, regenerative braking. This, of course, is only true if you add the words " with a D.C. system," because regenerative braking has always been a marked operating feature of the three-phase Italian State Railways and the split-phase Norfolk and Western electrification. It is unquestionably a most valuable feature, and a successful solution of the problem of working regeneratively with D.C. series motors will go far to extend their use in general railway electrification. Its importance, from a railway point of view, is well brought out by Mr. C. H. Quinn, chief electrical engineer to the Norfolk and Western Railway, who, in a paper read before the New York Railroad Club in March of last year, referring to the regenerative properties of his locomotives, saya:—" The unqualified success of the regenerative features of these engines haa practically eliminated the use of the air brakea for the governing of the train movements down the grade. The only time at which the automatic brake is brought into use is when it is desired to briug the train to a stop. The use of retaining valves, for the purpose of braking trains on our grades under elcctric operation, is unknown. It is to be regretted that we cannot place a definite value in dollars and cents on the benefits derived from this particular characteristic of these locomotives. To be appreciated, one must necessarily be familiar with some of the operating difficultiea in successfully handling with air brakes 90 car trains on a 2 per cent. grade. The elimination of broken knuckles, train breaking in two, not to speak of other incidental delays due to the failure of the air brake equipment in long trains to properly function, are some of the benefits which we are deriving every day from the use of the regenerative braking feature of these engines." It would add considerably to the interest of the paper if the author would give us a fuller description of the regenerative control system illustrated diagrammatically in his paper. What would appear at first glance to be a somewhat similar arrangement was developed by the Jeumont Co. (Ateliers de Constructions Electric du Nord a de l'Est), and was applied with, I believe, satisfactory results to the Metropolitan Railway, Paris. This Jeumont system consisted of a motor, exciter and control generator, and acted on what one may generally call the differential system. Test figures showed an economy of some 20 per cent. over the standard equipment, the energy returned to the supply system during braking reaching as high as 30 per cent. of the energy used during acceleration. The weight of the apparatus, suitable for a two 175 h.p. motor equipment, was 4,070 lbs., and in this connection it would be interesting if the author could give us the weight of the G.E. equipment with the four 400 h.p. motors in the case under review. There would, however, seem to be this essential difference between the two systems: that, whereas in the Jeumont system the regenerative control apparatus also served to give full field control throughout the cycle of operations, it would appear that the system briefly described by Mr. Kirkland is only used for regenerative purposes.

(To be continued.)

THE WEEK IN THE SHAREMARKET.

Boom in Leeuwpoorts and African Farms—Run on Small Stocks—Improvement in Better Goods—The Market Widens.

On Saturday morning Leeuwpoorts and African Farms again monopolised the market with sales up to 42s. and 15s. 10d. respectively. The previous day the former fell at one time to 38s. 3d., closing at 40s. 6d. Members had become aware that a big bear account was open and took advantage of the information. At the call prices of the two stocks gave way slightly. There was very little activity in other securities. Consolidated Lands had a further advance and also Modder Bs. Modder East came unchanged. Government Areas, Springs and Van Ryn Deeps the turn easier. Leeuwpoorts had considerable fluctuations after the call, the minimum price being 40s. 6d. African Farms were brought down to 15s. 1d. Zaaiplaats also came in for an attack, and their lowest point was reached at 16s. 6d. African Farms closed at 15s. 2d. and Leeuwpoorts at 39s. 6d. Zaaiplsats recovered to 17s. 1d.—17s. 3d. At Monday's opening Leeuwpoort's high-water mark was 40s. 9d. and African Farms 15s. 8d.; Zaaiplaats improved to 17s. 6d. and Sakalavas to 12s. The call was active with a general improvement, notably in the Modderfontein section. Leeuwpoorts and Africans weakened somewhat. On Tuesday morning Zaaiplaats attracted general interest, touching at one time 19s. 9d. and then receding somewhat. Business at the call was considerably less in volume than on the previous day, but prices were fully maintained with advances in most of the leading stocks, Sub Nigels being specially strong. Leeuwpoorts and African Farms suffered a further set-back. After the call a demand set in for what is known as "Baby Subs," the partly paid shares in Sub Nigel, the price advancing to 12s. In the afternoon East Rands came to the fore and sales were booked at 4s. 6d. The following were also better, with sales of Kleinfonteins 14s. 6d.; Lydenburg Farms, 10s.; Laces, 12s. The opening on Wednesday was active. East Rands taking the lead with sales from 5s. to 6s. 9d. Kleinfonteins made from 14s. 6d. to 15s.; Laces, 12s. 6d.; State Mines, 80s.; Zaaiplaats, 19s.; Leeuwpoorts, 38s. 9d.; and Springs, 68s. At the call a parcel of 2,000 East Rands changed hands at 6s. 6d. Very little was done in the Modder stocks, but the market generally was firm and active, most of the dealing, however, being in the smaller stocks mentioned at the opening. The reason given for the sudden rise in East Rands is a report that a rich strike over a good stoping width had been made in the vicinity of the Cinderella Deep. During the course of the day the small stocks, which had advances in the morning fell away, East Rands dropping to 5s. 6d. At the close the better class goods were in demand, with sales of Springs at 69s. 6d.; Van Ryn Deeps, 69s.; State Mines, 80s. 3d.; and buyers of Rand Selections at 86s. 6d. State Mines were again in demand at the opening on Thursday, with sales at 80s. 6d., also Springs Mines, which were dealt in at 70s. 3d. and 70s. The first named improved still further at the call. The good stocks maintained their position, but most of the small fry came back, for the welfare of the outside public, who generally benefit (morally if not financially) by these fluctuations. The following unlisted shares were dealt in during the past week:—Sales: S.A. Alkali, 45s. to 50s., closing sellers at the higher price; South Van Ryns, 18s. 3d. to 14s.; Sakalavas, 12s. 6d. to 11s.; West Springs, 23s. 3d. to 22s.; Options, 8s.; Makanyene Diamonds, 20s.; Phoenix, 1s. to 10d.; Henderson's Options, 10d.; Mauss Syndicate, 20s. odd lots. Sellers: Monteleos, 36s.

Sub Nigels and Government Areas were the features on Friday morning, the former making 28s. 3d. and the latter 82s. 3d. The following alterations in prices took place at the call:—Sales: African Farms, 14s. 3d.; Apex, 7s.; Banties, 3s. 3d.; Bush Tins, 11d.; City and Suburbans, 8s. 6d.; Dagga Mines, 23s.; East Rand Coals, 2s. 3d.; East Rands, 5s.; Geduld Props, 39s.; Government Areas, 82s. 3d.; Kleinfonteins, 16s. and 15s. 9d.; Modder Deeps £7 5s.; Modder Bs., £7 18s.; Modder East four-year Options, 6s. 11d.; S.A. Lands, 6s. 2d.; Sub Nigels 28s. 3d.; Mines Selections, 26s.; Springs, 69s. 6d.; Zaaiplaats, 18s. 6d. Buyers and sellers: City Deeps, 51s. 9d.—52s.; Clydesdales, 16s. 6d., buyer; Consolidated Langlaagtes, 17s. 6d.—18s.; Eastern Gold Mines, 1s. 3d.—1s. 6d.; Lace Props, 11s. 9d.—12s. 3d.; Modder East three-year Options, 4s. 11d.—5s.; New Modders, £25 12s. 6d.—£26; Pretoria Cements, £6; Van Ryn Deeps, 69s. 6d., buyer; Village Deeps, 15s. 6d., buyer.

	Fri., 16th		Sat., 17th		Mon., 19th		Tues., 20th		Wed., 21st		Thurs., 22nd	
African Farms	15	3	15	7	15	4	14	9	14	11	14	7
Anglo-Amer. Corp.	—		31	0*	33	6†	30	3*	34	6†	33	0*
Apex Mines	8	9*	7	0*	7	3	7	3*	7	3*	7	3*
African & Eur. In.	10	0*	10	6*	10	6*	10	0*	10	6*	10	6*
Bantjes Cons.	3	1*	3	0	2	9	2	10*	3	0	3	1
Brakpan Mines	—		78	0†	78	0	†78	0†	77	0†	77	6†
Breyten Colls.	12	0†	10	0*	12	0†	10	0*	12	0†	11	0*
Brick and Potteries	—		3	9*	3	9*	3	9*	—		3	9*
Bushveld Tins	0	9*	0	10*	0	10*	0	9*	0	10*	0	10*
Cinderella Cons.	3	0*	—		—		—		5	0	4	0*
City and Subs.	9	0*	9	0†	9	0†	8	9†	8	9†	8	0*
City Deeps	51	0	50	0*	51	6	51	9	50	0*	51	3*
Cloverfield Mines	—		—		7	6*	7	6*	7	9*	—	
Clydesdale Colls.	15	0*	16	0*	16	6*	—		—		16	0*
Concrete Construc.	5	4*	5	6*	5	3*	5	0*	5	9†	5	0*
Con. Investments	—		21	0†	19	0*	19	0*	—		19	0*
Con. Langlaagtes	17	0*	17	3	17	3*	17	0*	17	6	17	0*
Con. Main Reefs	12	0†	12	0	11	6*	11	6*	12	0	12	6†
Con. Mines Sel.	25	0*	25	0*	25	0*	25	0*	25	3*	25	0*
Coronation Colls.	—		36	0*	37	6*	—		37	6*	—	
Coronation Frees.	1	1*	1	3	1	1*	1	0*	1	0*	1	2
Crown Diamonds	3	6*	5	0†	5	0†	4	0*	4	0*	3	0*
Daggafontein Mines	22	6*	22	9*	22	6*	22	6*	22	6*	22	6*
Do. Options	—		5	3†	5	0†	5	0†	—		5	6
Durban-Rood.	10	0*	10	0*	10	0*	—		10	0*	—	
Durban-Rood. Dp.	9	0†	—		10	0†	—		—		—	
East Rand Coals	2	0	2	0*	2	1	2	0*	2	1	2	2*
East Rand Deeps	0	9*	—		0	9*	0	9*	0	10	0	9*
E.R. Minings	16	0*	16	0*	16	0*	16	0*	16	0*	16	0*
East Rand Props.	3	1*	3	0*	3	6	3	0*	6	3	—	
East Rand Debs.	£58*		£58½*		£58½*		—		£58*		—	
Eastern Golds	—		0	10*	0	9*	0	10*	—		1	0*
Frank Smith Dias.	2	10*	2	9*	2	9*	3	0*	2	10*	2	11*
Geduld Props.	37	9	36	6*	36	6*	37	3*	37	0	37	6*
Glynn's Lydenburgs	—		19	0A	19	6*	19	6*	20	0A	19	6*
Govt. Areas	78	3	78	3	78	9	79	6	80	0	81	0
Jhb. Bd of Execut.	26	0*	26	0*	26	0*	26	0*	—		26	0*
Jupiters	3	6*	3	9*	4	0†	3	6*	3	6*	3	6*
Klerksdorp Props.	2	6	2	6	2	3*	—		2	9*	2	6*
Knight Centrals	3	7*	—		3	3*	3	5*	3	9	4	0
Lace Props.	11	3	11	6	11	3*	11	8	12	9	12	0
Leeuwpoort Tins	40	6	41	9	39	6	37	0	38	6	36	9
Lydenburg Farms	9	3	9	4*	9	4*	9	5	10	0	9	10*
Main Reef Wests	2	5*	—		2	5	2	6†	2	5*	2	6
Middelvlei Est.	1	0*	1	0*	1	0*	1	0*	1	0*	1	0*
Modder B.'s	152	6*	155	0	156	3	156	6*	156	0*	—	
Modder Deeps	139	6*	140	0	140	0	140	0	140	0*	142	6
Modder Easts	18	6*	17	9*	18	3	18	3	18	1½	18	0
Do. Options (3yrs.)	4	8*	4	0	4	9*	4	9*	4	9*	4	10
Do. Options (4yrs.)	6	9	—		6	7*	6	9	7	0†	6	10
Hume Pipes	33	6	34	0	33	9*	33	0*	33	9	34	0†
New Eland Dias.	25	0†	—		—		24	6*	25	0*	25	0*
New Era Cons.	10	0*	10	3†	10	0*	10	0*	10	0*	10	3
New Geduld Deeps	5	6*	5	6*	5	6*	6	0†	5	9*	5	9*
New Kleinfonteins	13	8	13	6	13	3	14	0	15	3	15	6
New Modders	£24¾		£24¾B		£25		£25¼		£25¼		£25⅜*	
New Unifields	4	6*	4	6*	4	6*	4	6*	—		5	6*
Nigels	4	6*	5	0	4	6*	4	9*	—		4	9*
Nourse Mines	—		—		17	6†	17	6†	17	6†	17	0†
Premier Prefs.	—		150	0†	150	0†	150	0†	—		140	0*
Princess Estates	3	2*	3	2*	3	2*	3	4	3	0*	3	4*
Rand Klips.	8	0*	8	3†	8	0*	8	0*	8	0	8	3
Rand Nucleus	1	3*	1	2*	—		1	3*	1	3*	1	2*
Rand Select. Corp.	85	0	—		—		85	0*	86	0*	86	0*
Randfontein Deeps	3	9*	3	9*	3	9*	3	9*	3	10*	3	10*
Randfontein Est.	13	6*	13	6*	13	9	14	0	14	6	15	0
Rooibergs	11	9	12	0	12	3	13	0	13	0	12	9
Roodepoort U.	2	6*	2	6*	3	0	3	0*	3	0*	3	0*
S.A. Breweries	26	0*	26	6*	28	0*	26	0*	26	0*	26	0*
S.A. Lands	6	1	6	2*	6	3	6	1*	6	2	6	3
Springs Mines	67	6	67	0*	67	6	67	6*	68	0	70	0
Sub Nigels	25	0*	25	9*	26	3	27	3*	27	0	27	0
Swaziland Tins	32	0	31	0*	31	3*	31	3*	31	0*	31	0*
Transvaal Lands	18	6	20	0	20	0	20	0	19	6*	20	6†
Trans. G.M Est.	16	3	15	0*	15	0	15	0*	15	6	15	0*
Van Ryn Deeps	68	3*	68	0*	68	6	69	3	69	3	69	3
Village Deeps	—		13	9	13	9	13	3*	13	0B	14	0*
Western Rand Est.	2	0*	2	0*	2	6†	1	9*	—		—	
Witwatersrands	23	0†	—		20	0*	20	0*	20	0*	22	0†
Wit. Deeps	—		—		8	9*	9	0†	9	0†	9	0†
Wolhuters	4	1†	4	0†	3	9*	4	0	—		—	
Zaaiplaats Tins	17	4	17	3	17	6	19	2	18	10	18	6
Union 5 per cent.	£104*		£104½*		£104½*		£104½		£106†		£104½*	
New State Areas	19	8*	19	3*	19	6*	19	6A	19	6B	19	6*

*Buyers. †Sellers. AOdd lots. BEx London.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Dull—Paraffin—S.A. Timber—Local Manufactures—Paper Trade—Iron and Steel —The Shipping Position.

Business is still very much on the dull side throughout mining material circles. However, now the Chief Buyer has returned from his holiday, hopes are entertained that September will be a better month. According to the information received through a broker from the Chief Buying Office, it is said that the mines during this month have been very sparse with their requisitions, therefore the Buying Office had little to pass on to the Exchange.

The Paraffin and Oil Question, Grease, etc.

It is expected that the mines will shortly come into the market for all kinds of oils, therefore a further rise is expected, particularly for spot orders. The lubricating and cylinder oils are those mostly affected, as the demand is so world-wide owing to the huge requirements for the war, either directly or indirectly. The paraffin position is much the same as regards supplies which are not expected before October. The one company having a small stock still continues its small weekly doles to its long-standing customers. The retailers getting this are on the whole playing the game and allowing their own customers to have a certain proportion according to previous averages. Undoubtedly the Government proclamation as to prices steadied paraffin, as one does not hear of fancy prices being paid. The petrol position has not improved, but the distributing houses now have the matter so well in hand that with great economy the present supplies will last through until new arrivals. Local A.F. grease is up to £36 per ton on account of both Britain and America having prohibited exports, also our raw material for its local manufacture is getting scarcer and dearer. There is a little imported cup grease available at 1s. 1d. lb. Linseed oil is in fair supply, but there is not too much white lead about—in each case prices are unaltered. Turpentine is still acutely scarce and ordinary holders are chary about selling even small quantities unless to recognised customers.

Imported and South African Timber.

South African deals, 3 x 9, are 5s. 6d.—6s. per cube for whites and 7s. yellow pine. In consequence of the high price of the Baltic variety, several of our local saw mills are making a speciality of sawing South African timber, so much so that one mill is putting in an electric light installation for the purpose of working at nights. The native

mahogany is being handled by the mill in question as a special feature for cabinet and furniture making. Mining poles and bulk timber are not any too plentiful on the Rand in consequence of the difficulty of the railway department supplying the necessary trucks and loco power. The price of imported deals is a fraction of a penny dearer. Oregon bulk timber is getting acutely scarce and poplar is almost unobtainable. Galvanised iron roofing is on the scarce side, and is about a penny per foot higher for the 24 gauge, awaiting Canadian and American consignments. Business is not so brisk as it was, as many contracts were not started this month as expected; however, now the warmer weather has materialised it is expected that September will show up better.

Local Manufactures and the Paper Trade.

An exhibition is in full play at the School of Mines, Johannesburg. It is under the auspices of the Designs and Industries Association, London, formed for the purpose of promoting the use of better designs in all British industries and products. The exhibition serves to show the high quality of the Rand printers and lithographic artists. There are also excellent specimens of the English and French printers' art. As regards the paper-making trade, South Africa has not done much so far, but it may be that such an exhibition as the one mentioned may assist in a further improvement thereof. In this connection the Minister of Mines and Industries stated that he noticed that a small attempt was being made to use waste paper by the Premier Paper Milling Company at Klipriver, near Vereeniging. Again, the Walmer Papyrus Pulp Co., Ltd., of Natal, has actually secured machinery in America to be erected at Umfolozi, Zululand, to manufacture papyrus pulp to be exported to Britain or any other market where there is a demand. The scheme at present does not include the actual making of paper in South Africa, but of exporting the raw material in the "half-shiff" state. It is also stated that there is an area at St. Lucia, Zululand, sufficient to produce 100,000 tons of pulp.

Iron and Steel.

Business has been particularly dull in the bar iron trade, and there are very few enquiries from anywhere. There is less demand for girders for the best buildings, simply because we are passing through a lull, which somehow affects Johannesburg periodically. There is a big parcel of brass and copper material at the coast, but the belated advice as to details is still awaited with anxiety. Pipes and pipe fittings are very poorly requisitioned for through the Exchange indents. According to the second-hand merchants there are large quantities of pipes at various spots throughout South Africa, but very little is doing—there being quite an absence of activity. The foundries are getting very scarce of cast-iron scrap, and there is still no news of the pig iron either from Pretoria or Vereeniging.

American and British Shipping.

Nothing very definite is available in reference to shipping. However, it is certain that we shall not be left out in the cold, but according to the best authorities we must possess ourselves in patience until the European winter is further advanced, when the shipping position may become easier from America. In the meantime, we may expect cargoes of petrol and paraffin in October according to the latest Pretoria information.

Revised Price List.

Building Materials.—Timber: Deals, Baltic, 9 x 3, 2s. to 2s. 1d.; flooring, 4½ x ⅞ and 6 x ⅞, 11d. to 11½d. per sq. ft.; ceilings, 6 x ½, 7d. to 7½d. per sq. ft.; pitch pine, 9s. 6d. per cub. ft.; Oregon, 9s. to 9s. 6d. per cub. ft.; clear pine, ½in. x 12in., 1s. 6d. per foot; 1in. x 12in., 1s. 11d.; teak, 25s. to 26s. per cubic foot; shelving 1s. 3d.; Jarrah, 13s. 6d. c. ft.; poplar, 1in. x 12in., 1s. 9d.; scantling, 2s. to 2s. 1d. ft.; beaver boards, 9d.; galvanised iron, 24 gauge, 6ft. to 10ft., 2s. 2d. to 2s. 3d.; 11ft., 2s. 3d.; 12ft., 2s. 3½d.; 26-gauge, 6ft. to 8ft., 1s. 10d.; 9ft. and 10ft., 1s. 11d.; flat galvanised, 24 and 26-gauge, 110s. 100lb.; floor brads, 90s.; ceiling, 75s.; wire nails, 75s. to 120s. 100lb.; locks, rim, 72s.; mortice, 80s. per doz.; steel ceilings, 80s. to 85s.; roofing material, 1 ply, 45s.; 2 ply, 52s. 6d.; and 3 ply, 57s. 6d. per roll.

Bricks, Cement, Lime, Etc.—Pretoria Portland Cement, 9s. 3d. bag; 8s. 3d. truck loads; lime, white, unslaked, 7s. 6d.; truck loads, 6s. 6d.; slaked, do., 5s. 6d.; blue, 4s. 5d.; plaster lime, 5s. 6d.; bricks, stock, delivered, 65s. to 70s.; wire cuts, 70s. to 80s.; pressed, 70s. to 80s. 1,000; road transport expensive when obtainable; salt glazed, £17 17s., and white glazed bricks, £35 per 1,000; roofing tiles, £17 10s. to £27 10s. per 1,000; glazed tiles, 17s. 6d. to 27s. 6d. yard; paving cement tiles, 8s. 6d. per yard laid; reinforced concrete columns, 6ft. plain, 25s.; fluted, 30s.; hreclay bricks, £8 10s. to £10 10s. at kiln, per 1,000; clay chimney pots, 45s. to 80s., according to height (12in. to 18in.) per dozen.

Oils, Paints, Lead, Oxide, Glass.—Linseed, raw and boiled 14s. to 15s. O.M. gallon; white lead, 1s. 6d. per lb. and 1s. 3d. in big lots; turpentine, 110s. 2/4 1-5 gallons; 10—1's; 5-6 imp. tins, 120s.; oxide in oil, 60s. per 100 lb.; dry oxide, 13s. 6d. to 16s.; linseed oil putty, 9½d. per lb.; paints in tins, 1s. 6d. per lb.; British plateglass, ½in., 8s.; do., mirror, 8s. 6d.; window, 16oz., 1s. 6d. to 1s. 9d. per foot; and fancy glass, 2s. per foot.

Grease.—Imported, A.F. axle, £37½ local, £31 to £31½ per ton; tallow (local), 8½d. per lb.; paraffin quotations unobtainable; petrol, 37s. 6d. to 38s. 2/4 I.M.P.; motor oil, 7s. to 8s. 6d. per gallon; engine lubricating oils, 37s. 6d. to 42s. 6d. per case; cylinder, 37s. 6d. to 42s. 6d.

Chemicals.—Mercury, £40 75lb.; bichromate potash, 5s. 6d. lb.; chlorate, 4s. 6d. lb.; permanganate, 18s. to 18s. 6d. lb.; alum, 7d. lb.; carbolic acid, 5s. 6d. 1lb.; borax, 115s. 100lb.; cyanide sodium, 2s. 3d. to 2s. 6d. per lb.; hypo, 1s. lb.; nitrate lead, local, 51s. 100lb.; litharge (assay), 70s. to 72s. 6d. (commercial), 58s. 6d. 100 lbs.; zinc sheets and blocks, 1s. 9d. lb.; locally-smelted zinc, 6½d. lb.; plumbago crucibles, 6½d. per number; carbide, 100s. to 110s. 100 lb.

Electrical Goods.—Lamps, high voltage, British, Holland and American, 33s. to 36s. wholesale, and 48s. to 54s. doz. retail; carbon lamps, 20s. dozen; pure rubber flex, 6d. to 8d. yd.; 3/20 coils wire, 60s. to 65s.; ditto, 3/22, 45s. to 50s.; 7/22, 75s. to 80s.; 7/20, 130s. 7/18, 170s.; tubing, 40s. to 45s. per 100ft.; keyholders, 4s. 6d. to 5s. each; round blocks, 3½in., 5s. to 5s. 6d. dozen; lamp holder cord grips, 15s. to 15s. 6d. per dozen; switches, 5 amp., 36s. to 37s. 6d. per dozen; British glass shades, 30s. to 40s. dozen; porcelain sbackles, 15s. to 18s. dozen; do., bobbins, 25s. to 30s. per 100; cleats, 22s. per 100; P.O. insulators, 18s. dozen.

Iron and Steel.—Steelplates, 85s. to 95s., many sizes unobtainable. Hexagon and cuphead bolts, ¼in. diameter, 2s. to 2s. 6d. per lb.; 5-16in. diameter, 1s. 9d. to 2s. per lb.; ⅜in. diameter up to 3in. long, 1s. 9d. lb.; ⅜in. dia., 1s. 6d.. 3½in. and up long 1s. 6d. lb.; ½in dia. up to 2½in long, 77s. 6d. 100lb; ½in dia. and 2½in up long, 75s. per 100lb.; ⅝in. diameter up to 2½in. long, 85s. per 100lb.; ⅝in. dia. 2¾in. and up long, 60s. per 100lb.; ¾in. diameter, 2¾in. and up long, 55s. 100 lb.; ⅞in. and 1in. diameter, same price as ¾in. diameter; nuts, ⅜in., 1s. 3d. per lb.; ½in., 85s.; ⅝in. 95s.; ¾in. and 1¼in., 85s.; 1⅜in. to 1⅝in., 87s 6d.; 2in. up, 92s. 6d.; washers, all 45s.; rivets, 3-16in., 1s. 6d. lb.; ¼in., 5-16in., 1s. 6d. lb.; 7-16in., ⅜in., 1s. 3d. lb.; ½in., 75s. to 80s.; ⅝in., 72s. 6d.; ¾in. up, 60s. 100 lb.; shoes and die, 32s. 6d. to 35s., 100 lb.; rails, £25 per ton; picks, 4lb., 40s. dozen; shovels, 80s. to 90s. dozen; drill hammers, 5½d. to 6d. per lb.; hammer handles (best American), 14in., 4s. 6d.; 24in., 10s.; 30in., 14s.; 36in., 17s 6d. per dozen; metal, anti-friction knoxite, 11d. to 4s. and special prices per lb.

In consequence of the daily, and even hourly, variation in prices, the Editor will answer reply-paid telegrams to verify any quotation in our list.

Engineering Notes and News.

GRAIN ELEVATORS FOR SOUTH AFRICA.*

Big Government Scheme Proposed—Enormous Possibilities.

In response to a resolution adopted by the Annual Maize Conference at Pretoria on July 10, 1917, the Government requested Sir William Hoy, General Manager of Railways, to convene a Special Committee to consider the question of the establishment of grain elvators in South Africa and matters incidental thereto. The report, together with Sir William Hoy's recommendations, has just been issued as a Parliamentary Blue-Book, and forms a volume of absorbing interest. The committee consisted of Messrs. G. C. S. Clark, C.M.G., Assistant General Manager of Railways, Johannesburg, who acted as chairman; W. A. Doherty (representing the S.A. Chambers of Commerce), P. J. du Toit (Department of Agriculture), W. R. Findlay (S.A. Grain Trade Association), C. H. Keet (Transvaal Co-operative Societies), D. S. Pargiter (Homeward Conference Steamship Lines), W. H. Pilkington (S.A. Maize, Breeders', Growers' and Judges' Association), W. J. K. Skillicorn (S.A. Railways and Harbours), and S. G. Vilonel (S.A. Agricultural Union). Mr. Skillicorn also acted as secretary of the Committee.

SUMMARY OF MAIN POINTS AND RECOMMENDATIONS.

The details of the report are necessarily somewhat voluminous, and, for this reason, the following summary is given of the main points and recommendations:

(a) For many years past the interests concerned in South Africa have urged the adoption of the elevator system, and in 1911 the late Sir Thomas Price, K.C.M.G., recommended that elevators be erected in South Africa.

(b) Practically all the countries (including even Russia and Bulgaria) handling grain in large quantities, have now adopted the elevator system.

(c) The evidence taken by the Committee shows that every interest concerned in the grain industry—the general business community, official and shipping circles, banks, and others—strongly urge the immediate adoption of the elevator system.

(d) The disabilities inseparable from the present system are so pronounced, that the substitution of the elevator system for the present system is essential to secure a sustained, large increase in the grain production of South Africa, the possibilities of which are enormous.

(e) It is demonstrated that under anticipated post-war conditions, and taking a conservative estimate of certain savings which can be definitely located, there should result from the elevator system—when it became fully established and the industry had been adapted to the bulk system—a direct financial saving to South Africa of at least £500,000 per annum, after paying interest, depreciation, repairs and cost of operation of the elevator system. In calculating the above savings, no charge has been made against the present system for interest, depreciation, and repairs for railway, harbour, and private sheds, and stores used for grain, whereas the elevator costs include those items. The above estimates do not include the following material advantages, which cannot accurately be expressed in figures: (i.) Savings to railways and harbours through more rapid handling and movement of grain traffic; avoidance of congestion and of detention of trucks, etc. (ii.) Savings to railways and harbours through economy of space, lesser expense for harbour land, sheds, wharves, channels, etc., and through costly harbour extensions being avoided. (iii.) Pooling of maize for rail transport. (iv.) Advantage of negotiable certificates, which will facilitate trade and reduce cost of marketing. (v.) Impetus to increased production resulting from improved storage and transport facilities, better returns received by the farmer, and more stable market conditions. (vi.) Release of labour for productive work. (vii.) Elimination of disputes *re* weights and grades.

(f) For reasons given the Committee is of opinion that a material increase in the maize production of South Africa may be expected in the near future.

(g) The Committee recommends that elevators, of the capacities shown below, be erected, at the earliest possible time, at the undermentioned places:

Port Elevators.	Storage Capacity. Bags.
Durban	300 000
East London	200,000
Capetown	200,000
Total port elevators	700,000

Estimated cost, £490,000.

Country Elevators.—Reitz, 60 000 bags; Frankfort, 60,000; Ventersburgroad, 10,000; Kroonstad, 30,000; Kapjes, 20,000; Fouriesburg, 10,000; Ficksburg, 20,000; Gumtree, 10,000; Clocolan, 20,000; Marseilles, 15,000;

Westminster, 15,000; Coalbrook, 10,000; Heilbron, 60,000; Rendezvous, 15,000; Verfontein, 15,000; Bothaville, 25,000; Lovat (or Steynsrust), 15,000; Lindley Road, 20,000; Senekal, 25,000; Kaalhaagte, 15,000; Bethlehem, 30,000; Harrismith, 10,000; Potchefstroom, 20,000; Klerksdorp, 25,000; Maquassi, 10,000; Leeuwdoorns, 10,000; Ventersdorp, 20,000; Makokskraal, 10,000; Coligny, 15,000; Vermaas, 15,000; Koster, 10,000; Middelburg, 20,000; Delmas, 10,000; Oogies, 10,000; Devon, 15,000; Leslie, 20 000; Kinross, 30,000; Trichardts, 15,000; Bethal, 60,000; Davel, 10,000; Krantzpoort, 15,000; Balfour, 40,000; Greylingstad, 10,000; Val, 15,000; Cedarmont, 10,000; Holmdene, 10 000; Standerton, 10,000; Ascent, 10,000; Vrede, 20,000; Winterton, 10,000; Estcourt, 10,000; Donnybrook, 10 000; Porterville Road, 10,000; Kalabas Kraal, 15,000; Malmesbury, 10,000; Moorreesburg, 20,000; Piquetberg, 15,000; Klipdale, 30,000; Rietpool, 10,000; Krige, 10,000; Caledon, 20,000; Johannesburg, 20,000. Total, country elevators, 1,165,000 bags, to cost £466,000. Grand total, port and country elevators, 1,865,000 bags, to cost £956,000.

(h) It will be observed from (e) above, that the direct financial savings to South Africa, after paying interest, etc., and costs of operation of the elevator system, are estimated at not less than £500,000 per annum, so that they should in two years amount to more than the total capital cost of the elevators.

(i) More than three-quarters of the total capital expenditure involved would be disbursed in South Africa.

(j) It is not certain that the total costs of erecting elevators would be lower after the war than at the present time; but, even if they were, any savings in initial costs which might be gained by postponing erection until after the war, would be less than the loss which would be sustained in a month or so by a continuance of the present system.

(k) It is estimated that the total annual costs for interest, depreciation, repairs, and cost of operation of elevators, should not exceed: Port elevators, 2d. per 200 lbs.; country elevators, 3d. per 200 lbs.; general administration and contingencies, 1d. per 200 lbs.; total for two elevators, 6d. per 200 lbs.

(l) Details of the tariffs recommended by the committee are given in the report. They amount to 4d. per 200 lbs. if only one elevator is used, and to 5d. per 200 lbs. for grain for export (6d. per 200 lbs. for grain for local consumption) if two elevators are used. For grain railed in bulk to an elevator from a station at which there is no elevator, the tariff recommended is 3d. per 200 lbs. These charges are for the following services: Receiving grain into and discharging from elevators port and inland), grading, cleaning, fifteen days' storage in each elevator, insurance against all risks (including loss of weight), and issue of negotiable warehouse receipt. The storage charges recommended are at the rate of 2d. per 200 lbs. per month from July to September inclusive, and 1d. per 200 lb. per month from October to June inclusive. It is recommended that the elevator system should be self-supporting, financially, but that no profits should be made out of the tariffs levied for use of the elevator system.

(m) Every facility will be extended by the shipping companies for the conveyance of maize from South Africa in bulk.

(n) It is recommended that the elevator system should be owned by the Government, and operated by the Administration of Railways and Harbours.

(o) Steps which the committee recommend should be taken by the Government. It is necessary to emphasise that the port elevators would not be ready for use until about fifteen months had elapsed from commencement of work—six months for preparation of foundations and nine months for erection of the elevators, including storage bins, machinery, etc. An investigation on the spot by a consulting engineer to decide details of design, sites, etc., would occupy several months. Two months would probably elapse from the time a European or American consulting engineer was selected until he actually commenced work in South Africa. Some time would be absorbed in arranging the details of erection. It is, therefore, evident that the port elevators would not be available for use until at least 1½ years later, if the Government decided to provide elevators. If therefore, the elevators are to be available for the 1920 crop, it will be necessary for an early decision to be come to on this question, and, thereafter, for prompt action to be taken by all concerned. The Committee accordingly recommends: (i.) That, assuming the Government decides to provide elevators, a cable be sent with a view to a first-class consulting engineer, with special experience of elevator construction, being engaged to investigate South African conditions on the spot, and to advise the Government as to details of design, sites, etc., and draw up specifications; (ii.) that, in view of the far-reaching changes involved, the work of drawing up the details of organisation be put in hand at an early date.

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